Petroleum Today

SUMMER 1961

In this issue

EYE ON THE UNKNOWN

The exciting world of research photography

DERRICKS AND SABERS

Petroleum's role in the Cold War

HOW YOU CAN STRIKE OIL

An unusual do-it-yourself feature

Petroleum Today

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Robert W. Stock, *Editor*

Edward W. Atkinson, *Associate Editor*

Libby-Ann Watterson, *Associate Editor*

Cover: A drop of oil burns at the tip of a quartz thread, and a high-speed movie camera captures the action. For more on a new tool of industry research, see page five.

They're Off!

The sun shines, the road beckons, and the season of vacation travel is upon us. Ten leading travel editors take the occasion to confess their own favorite tour targets.

THE voice of the turtle has been heard in the land. Now comes the call of the open road. From Maine to the Rockies and beyond Americans are preparing for the annual vacation trip. The family car is undergoing a complete physical at the local garage. Roadmaps have replaced best-sellers. After a long, dull winter the "who-can-find-the-most-out-of-State-license-plates" game is beginning to get interesting.

This year more than 30 million vacation-bound cars, carrying 90 million passengers, will travel some 65 billion miles along the nation's highways and byways. For vacationers are expected to do more motoring in 1961 than ever before.

Why the increase? Automotive firms might point to the improved comfort and economy of their products; oil firms, to the "freedom to go" made possible by 200,000 convenient service stations dispensing quality gasoline and lubricants; motel associations, to the proliferation of comfortable motor inns. On the other hand, a less partisan observer might suggest that the desire to travel has always been there: it's the nature of the (human) beast. More Americans will take to the road this year because more can afford to fulfill their desires.

Assorted polls and surveys have been conducted to explain the desire to travel. The social scientists have had a field day with their "questions in depth." The results, however, have been somewhat disappointing; the motorist's motives have defied precise analysis. Perhaps an earlier student of man, Francis Bacon, had the answer: "Travel in the younger sort, is a part of education; in the elder, a part of experience."

Pollsters have had greater success with more down-to-earth questions such as, "Where do you plan to go on your vacation?" One survey found that Americans expect to travel more within their own nation in 1961 than in previous years. Plans to take a European vacation were 25 percent under 1960; plans for trips to other locations abroad dropped 26 percent. And most of the motoring in this country will be of the regional variety, the vacationers traveling in their own or neighboring States.

As its contribution to the body of knowledge of travel habits, PETROLEUM TODAY has polled 10 leading travel editors as to their personal preferences in vacation targets. Nine of the 10 are travel editors of newspapers in various sections of the country; they were asked to name their favorite sites in their own regions. The 10th, who is with a national editorial service, was given the entire nation to choose from. The 10 experts' views are set forth on the following pages, together with their tips for motoring vacationers.

Busman's Holiday for Travel Editors:

Byron Fish, *Seattle Times*—

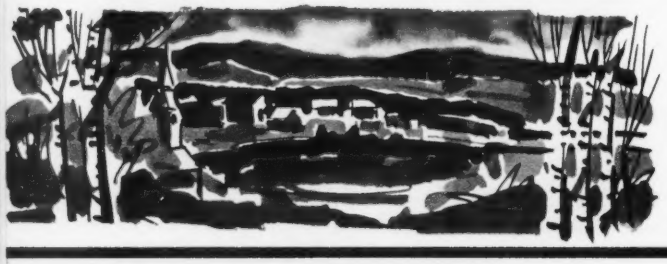
"Living in Seattle, on the green, damp side of Washington, I head for the east side of the Cascade Mountains when I want to feel I'm away. I get a complete change of scenery in three hours' drive—from the Evergreen State of the tourist brochures to desert-type coulees. Sun Lake State Park, just downhill from Dry Falls, is a fine public spot. It's in the Grand Coulee, and it boasts a fine chain of lakes."

Adeline McCabe, *Wyoming Eagle—Wyoming State Tribune*—

"The Teton Range in Wyoming includes 10 of the major peaks in our country and rivals the Swiss Alps in scenic beauty. Here, in the Jackson Hole country, the family traveling by car may see elk or buffalo and can't miss antelope, moose, and deer. Sparkling-clear lakes and streams provide the best fishing in the United States, with the fewest competing fishermen."

Joseph A. Jost, *St. Louis Globe-Democrat*—

"In my travels I have been most impressed with Excelsior Springs, Missouri, just 28 miles from Kansas City. The town, which owes its existence to the numerous health clinics and medical centers, is the only spa in the nation where all four of the essential mineral waters are found together."



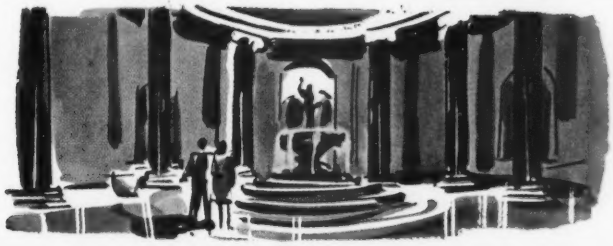
Leavitt F. Morris, *The Christian Science Monitor (Boston)*—

"My favorite place to travel in my part of the country is the State of Vermont. Its friendly green mountains, lush countryside, its mellow and picturesque old villages, its time-honored and leisurely way of life, and varied scenery in a compact area—all of these contribute to its attraction."

John McGuire, *New York World Telegram and Sun*—

"New York City—specifically Manhattan Island—can't be beat! A large number of outdoor beauty spots, historical sites, beach and woodland resorts are all easily accessible in this large area. Manhattan's singular advantage is that it is international in flavor. It is a telescoped treasury of the world's music, dance, art, and the best in food, drink, and entertainment."

Their Regional Favorites

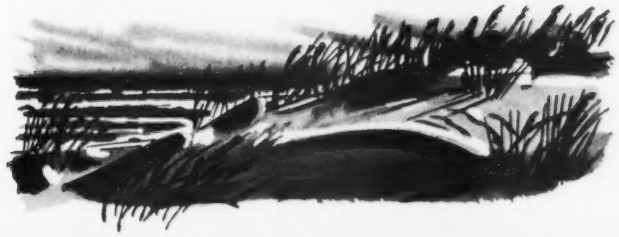


John McLeod, *Washington (D. C.) Daily News*—

"There's no place like the Nation's Capital. The National Gallery of Art, for example, is beautiful just as a building besides housing some of the world's greatest paintings. The best time to visit it is Sunday night, when Richard Bales conducts one of the free concerts which are open to the public."

Herb Rau, *Miami News*—

"The Florida Keys are the most popular car-visit area in Florida, and my favorite too. From Miami to Key West, it's 175 miles of island-hopping, over manmade bridges and causeways following the original railroad tracks set down by Henry M. Flagler. The keys are dotted with motels and hotels all the way. Plenty of campsites, roadside rests, and open beaches and bridges for fishing along the way."



Jean Simmons, *The Dallas Morning News*—

"My favorite travel place is Padre Island, 'way down at the southern tip of Texas. Its appeal to me rests in the fact that so little of it is as yet developed, while, at the same time, there are several good new motels with every convenience you could want. On Padre, you can drive along the beach itself, beachcomb, or collect shells. Fishing is good; so is swimming."

Elmar Baxter, *Los Angeles Herald and Express*—

"My vote goes to Las Vegas, not because of legalized gambling but because of its many other attributes. Las Vegas has climate, scenery, magnificent hotel and motel accommodations at reasonable prices. Swimming, riding, golf, and sightseeing are excellent. Hoover Dam and Lake Mead are nearby. Entertainment is the biggest draw. Gambling is there if you want it, and most at least try. Some even win."

James H. Winchester, *King Features Syndicate (National)*—

"To me, the drive along the Big Sur Highway in California is one of the most beautiful and exciting trips in the world. The meeting of the sea and the mountains, the ever-present mood of peace and solitude are incomparable. Better, by far, than anything along the southern coast of France. One of the great motoring treats anywhere."

Travel Tips from Experts

Some suggestions for vacationers-on-wheels from the panel of top travel editors

ONE. Don't be a travel snob. Don't avoid a place just because a lot of other tourists go there. Most of the popular spots are popular for good reason. After you've seen the place you've always heard about, then look for the esoteric.

TWO. For the restless or weary, child or adult, nothing does the trick like an unexpected stopoff, even if it's in the middle of nowhere. A stretch, a sip from the thermos jug, and most good tempers are restored.

THREE. Don't drive more than 250 miles a day. It's hard on everyone but particularly the driver. Don't turn a pleasure trip into a miles-per-day contest.

FOUR. If you plan to visit the western desert-and-mountain country, be sure to: Carry extra water for drinking and for refilling the radiator; check your carburetor in preparation for high elevations; check your fuel pump—it will have to take sustained uphill driving in a hot, dry summer atmosphere.

FIVE. To keep the family occupied, you might place bets on who will see the first snowcapped mountain, the first waterfall, the first large wild animal, etc. Father pays all bets according to a predetermined scale (State boundaries might be 50 cents, squirrels a nickel). The winnings provide spending money—it evens out over the length of a trip.

SIX. Put a carton of empty soft-drink bottles in your car. When you get refills along the way, you won't have to bother leaving a deposit.

SEVEN. Avoid driving at rush hours. Plan your overnight stopovers, and make a reservation at least eight hours ahead. Finally, and in a word, *plan.*

Observations on Peregrinations

A variety of comments on travel and the traveler, plus a cross-country tour of the U.S.A.

This truth keep in sight—every man on the planet
Has just as much right as yourself to the road.

John Boyle O'Reilly

Primitive, irresponsible, discourteous, and impatient behavior behind the wheel of an automobile has no place in society. Courtesy in an automobile is always one's best assurance of safety.

Emily Post

If some people didn't tell you, you'd never know they'd been away on a vacation.

Kin Hubbard

As the Spanish proverb says, "He who would bring home the wealth of the Indies must carry the wealth of the Indies with him." So it is in travelling: a man must carry knowledge with him, if he would bring home knowledge.

Samuel Johnson

Travel teaches toleration.

Benjamin Disraeli

Good company in a journey makes the way to seem the shorter.

Izaak Walton

The wise traveler, the self-indulgent and the happy one, is he who never looks at his timetable and hides his watch.

John Mason Brown

The soul of a journey is liberty, perfect liberty, to think, feel, do just as one pleases.

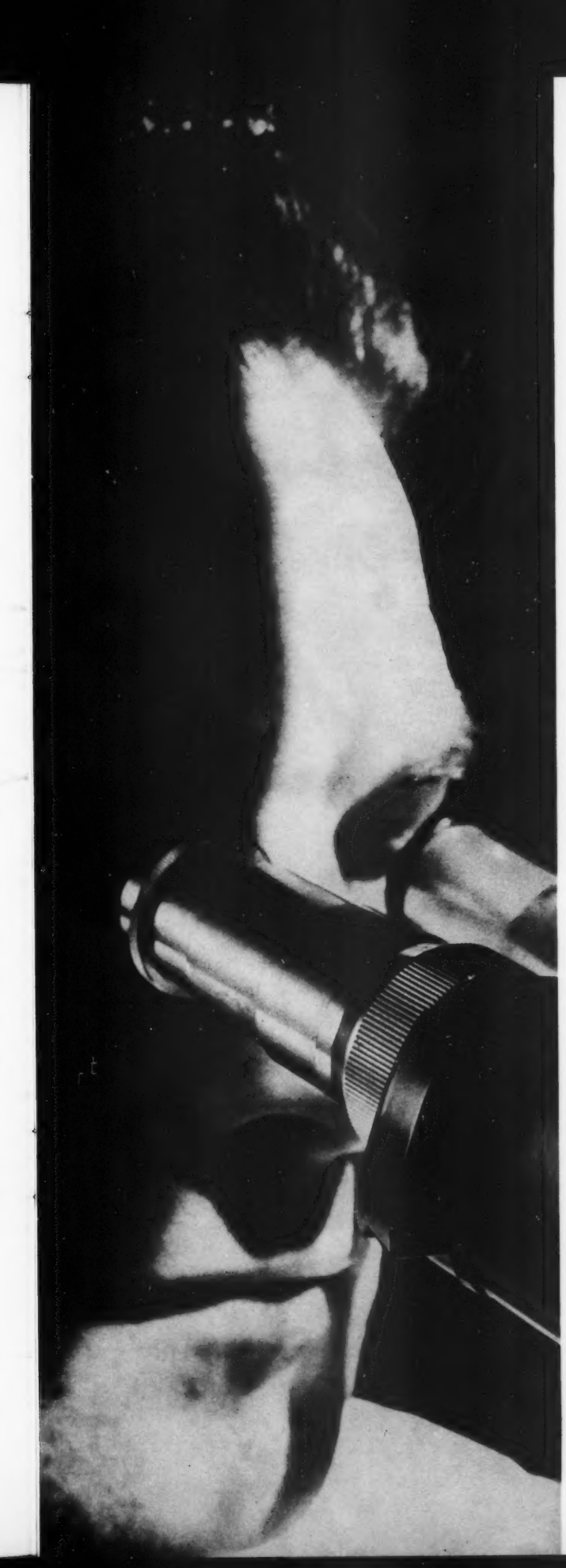
William Hazlitt

A wise traveler never despises his own country.

Carlo Goldoni

. . . We dwell
On the half earth, on the open curve of a continent.
Sea is divided from sea by the day-fall. The dawn
Rides the low east with us many hours;
First are the capes, then are the shorelands, now
The blue Appalachians faint at the day rise;
The willows shudder with light on the long Ohio:
The Lakes scatter the low sun: the prairies
Slide out of dark: in the eddy of clean air
The smoke goes up from the high plains of
Wyoming:
The steep Sierras arise: the struck foam
Flames at the wind's heel on the far Pacific.
Already the noon leans to the eastern cliff:
The elms darken the door and the dust-heavy lilacs.

Archibald MacLeish



EYE on the UNKNOWN

Research photography is adding a new dimension to scientific understanding and experimentation.

THE research men had a problem. They knew that, in theory, they could improve the efficiency of a blast furnace by adding oil to the flame. But first they required an exact understanding of the operation of the furnace, and that presented some difficulties. The burning process took place too fast for the human eye to comprehend its parts. And the furnace's 3,000° F. heat would melt any equipment placed inside.

The problem was hardly a unique one. It stemmed from the fact that sight is man's key tool toward rational comprehension, the key handmaiden to the brain. In dealing with a process (defined as, "a continuing development involving many changes"), man often can see only some of the individual parts, not the whole. In effect, he cannot see the forest for the trees.

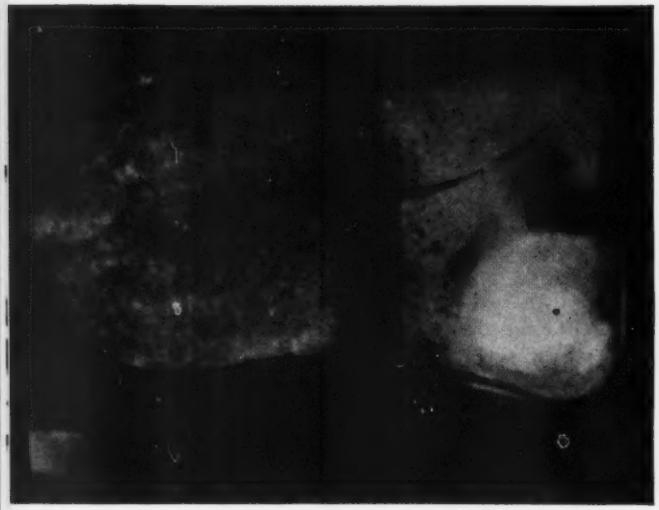
Such a handicap would seem to be insurmountable. But man has overcome it by an exercise of his imagination. He has suggested an explanation, a theory, of how a process might operate, and then he has worked within the framework of this theory. He has used the trial-and-error approach, and it has enabled him to make great strides toward a pragmatic, working relationship with the processes of his universe. He has not been able to see many of these processes, however; and thus the final knowledge of them has been withheld.

In the case of the blast furnace research, however, the scientists had special help with their problem. Newly developed high-speed movie equipment could capture the burning process and make it available for study; application of the principles of electronics and optics could "alter" time by expanding, reducing, or stopping it. The result: a technique expected to raise the productivity of steel blast furnaces by as much as 30 percent.

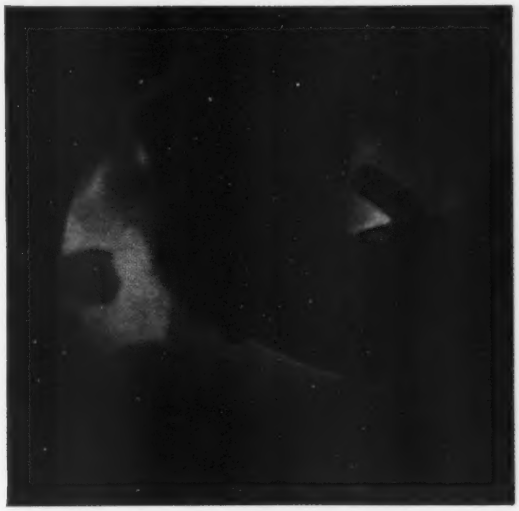
Research photography is opening new possibilities for scientific studies in a wide variety of industrial and defense areas. On the following pages are some sample photographs taken through the "third eye" of the high-speed movie camera in a petroleum research laboratory. They represent fresh insights into the heretofore "undiscoverable" world of process.

Pint-sized rocket engine is tested as part of an oil company's research into solid rocket fuels. Test takes place in an 18-foot-high sphere, and the rocket itself is just 18 inches tall.

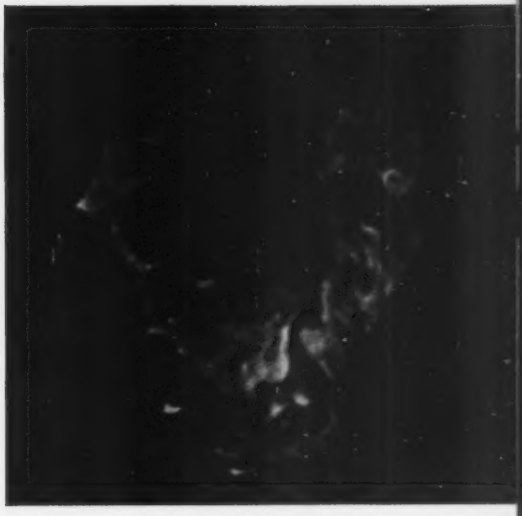
High-speed camera shows the inefficient combustion that takes place within an engine when the fuel is ignited by hot deposits on the walls of the combustion chamber. Condition is called pre-ignition.



Inside the combustion chamber of a home furnace: The high-speed movie equipment enables scientists to study the behavior of tiny drops within an oil spray during the burning process.



Coke burns within a blast furnace at a temperature of 3,000°F. Camera study aided oil researchers to develop a technique expected to increase greatly steel industry productivity.



Changes in the noise level of a furnace combustion chamber could not be explained on the basis of observations with the naked eye. Films revealed that the flame pulsed, causing the noise.

by Beatrice Levin

LETTERS FROM A

We met in the lunch line at the University of Wisconsin the first day of the winter semester in 1946. I asked the stranger behind me: "Would you please hold my place while I hang up my installment-plan fur coat?" When I returned, that stranger began a lecture on installment-plan buying, a lecture that continues to this day!

We were graduate students, Frank in physics and I in English. Frank decided that the "courtship" took too much time from studies; so he proposed that we get married in September. And he paid off in one lump sum what was due on the fur coat!

I had no concept of my husband's studies. He seemed to feel that if you weren't a physicist, then you couldn't really understand the important things of life. At first I thought he was kidding. He wasn't.

For 12 years now he has been a research geophysicist for an oil company. His job is to find new or improved methods of hunting for petroleum. He works at it in laboratories to some degree, but mostly, it seems, away from our Tulsa home. I mean far away. Much of the time we communicate by letter.

A recent one started this way:

Sheridan, Wyoming
February 4

Dearest Bea,

The drillers had been punching the hole down as if the rock were cheese, but they hit a hard formation yesterday. In eight hours they drilled only four feet. We decided to accept whatever depth is reached tomorrow evening and to log the hole Monday. We'd start our recording Monday afternoon. . . .

How's that for a letter?

From what I gather, Frank is involved in finding out what kind of rock structures exist under the surface of the earth. He does this with all sorts of electronic devices and with something called the seismic method. He has his men set off small explosions and record the way the shock waves bounce back to the surface from underground. And that, in some way, tells him things about what's below. Then, if it looks as though it's the kind of rock structure that might contain oil, his company will take a chance drilling.

Probably the most interesting group of letters came a few years ago. They'll give you an idea why our three sons (all future scientists, according to their father) and I spend so much time around the mailbox.

New Orleans, Louisiana
August 20

Dearest Bea,

I've been waiting a week now for a visa from the Venezuelan consulate. This morning I opened the consulate for them with my usual monumental patience. About 10 minutes after I got there, the consul general rushed in with a cable giving me a permit. Sent a cable asking someone to meet me in Caracas.

Caracas, Venezuela
August 29

Dearest Bea,

Today was the first of work down here and that part is fine. We'll fly to Lake Maracaibo where we'll board a boat for perhaps a week. The hotel is beautiful, and this must be one of the most impressive of all the world's cities. A glorious climate. In fact, there's so little variation in temperature that many buildings have no glass in the windows. . . . I gave a lecture this morning.

Lake Maracaibo, Venezuela
September 6

Dearest Bea,

For three days we've been roughing it on the lake. The boat is a sleek 85-footer carrying a huge reel and hydrophone cable on the fantail. Most of the deck is covered with a recording room (used to catch and record the seismic shock waves) and our living quarters, all air conditioned. The second night out I accidentally kicked off the conditioner unit. Much muttering and swearing when the room got hot as an oven. . . . Denny Meyers claims I'm always first in line for lunch. I'll sue. Sometimes I'm as far back as third. . . . We're working 10 days out on the lake and four days in port. I hope to start home soon. (Home, lovely word.) I might even make it for our anniversary. I really should be home for one holiday this year!

GEOPHYSICIST

He didn't make it home for our anniversary. Hoping to take advantage of those "four days in port," I took to substituting in the public schools to save enough money for a sitter for the boys and a ticket to Caracas aboard the *SS Southern Cross.*

Frank met me in La Guaira, the seaport closest to Caracas. It's a brilliant harbor, the towering Andean range casting sapphire and emerald shadows waveringly on the blue Caribbean. Then Frank told me he was on his way back to the boat. I had arrived on the last of his four days in port!

And that was that.

The "lovely word," as Frank called home, was bought under the GI Bill in 1951 and has just gone on growing. First, we added a screened porch; then, a small study, just off the kitchen, where I write; then, a dining room with beautiful ranch planking and a family room with a beamed cathedral ceiling.

It's the kind of place where you're welcome to put your feet up. And that goes for our two cars, too, vintage 1950 and 1955. But except for payments on the property, everything was paid for in cash. And not on the installment plan! Frank loves his work and his traveling, but I have a hunch he's glad to get back home. For example:

Ruston, Louisiana
November 15

Dearest Bea,

The seismic crew usually works a ten-hour day, but today we left at 7:30 and didn't return until after six. This morning I helped the operator put out geophones and helped him pick them up later, what they call "hustling jugs." Tonight I'm bushed. While I enjoy what I'm doing, I miss my research. (And, incidentally, my family.) I'm eager to get back to my lab. And to you, my dear.

Or this note from the Oklahoma Panhandle:

Guymon, Oklahoma
March 10

Dearest Bea,

That letter you forwarded was from Dr. Robert Stoneley, who teaches geophysics at Cambridge. He'll visit us in Tulsa the weekend of March 20. Maybe we can have a dinner party and invite some of the people who would enjoy meeting him.

It was bitter cold this morning out at the well. They drilled 46 feet and wore out a bit. Glad it's not my money—drill bits and pipe and all the rest, and at the end just a chance there'll be oil.

As I was writing this, I got a call from another field. I had been thinking how nice it would be in our living room tonight with a fire in the fireplace, the kids asleep, and a bottle of wine between us. (I have a bottle here and have had too much of it, but don't worry—the motel manager is driving.)

I answered the phone and the guy said: "Frank, they want to know if you can bring your crew over to this well. What'll I tell them?" I said: "Tell them to go put their heads in it!"

I remember once, when Frank was out of the country, our youngest, Philip, crawled into bed with me early one morning and muttered: "Mamma, I have an idea. Let's go to the airport and get Daddy!" He thought I had Frank hidden out there.

I wrote Frank about it, and he said it gave him the most acute case of homesickness he'd ever had.

While he's away, we keep pretty busy, of course. The boys go to school. And I teach creative writing or do community work or learn how to make Lobster Cantonese against the day Frank gets back.

Lately my geophysicist has been doing a different kind of traveling in addition to his field research work. He helps recruit graduating Ph.D.'s, and so he visits colleges to talk with faculty and gifted students. Now I'm liable to get letters from Brown University or Purdue as well as the Texas Panhandle, and they're very different.

But wherever the letters come from, I treasure them as I've treasured the hundreds I've received in years past. I like to think of them as a bridge that a married couple traverses to make an adventure of the spirit. Through what Frank writes me, I am able to share his life away from home as he shares our more prosaic existence in Tulsa.

This year we observe our 15th anniversary, and I have to admit we've had some hectic times. But I wouldn't change those years. If they've been hectic, they've been exciting and wonderful, too, for both my wide-ranging oilman and for me. And those letters from everywhere have played a big part in it all.

by Paul H. Giddens

Derricks and Sabers

The petroleum industry was born on the eve of the Civil War. A noted historian traces the impact of oil upon the conflict—and vice versa.

In a letter to a friend years after the Civil War had ended, Union veteran David Lowry wrote: "Although Memorial Day dates back from 1867 [sic], if I was asked where the first Army reunion was held I would answer unhesitatingly, 'On Oil Creek.' "

The stream in northwestern Pennsylvania had not figured in any major battles. Yet when the Civil War was over, thousands of men from North and South came together, in peace, to work in an industry that had grown from infancy to young manhood during the years of fighting.

"The greetings when they met," wrote Lowry, "were so unlike all other meetings I have witnessed that they were deeply impressed upon my memory. . . . men who fought against and captured each other, met with unmistakable friendship. . . . 'Hello! Haven't seen you since we made Humphrey Marshall jump at Mill Springs.' 'Shake! Yes, you had it pretty well your own way there and all through East Tennessee, but we evened up when we got down in Mississippi in '62.' "

That the oilfields of Pennsylvania should become the meeting grounds for veterans of North and South was symbolically appropriate, for the new industry represented the wave of the future in a unique manner. It was appropriate, also, because of the close ties between the events in the oil region and the course of the conflict just completed.

Although the fact is little recognized, the petroleum industry played a vital role in the Union victory, particularly in the economic sphere. President Ulysses S. Grant, for example, speaking in 1871 of Pennsylvania's part in the war, referred to "the importance of her oil products as an element of national wealth and resource during the same period." Five years earlier Sir S. Morton Peto, a London banker, reporting on the economic importance of oil in the war, had put it this way: "It is difficult to find a parallel to such a blessing bestowed upon a nation in the hour of her direst necessity."

But the story of the oil industry in the Civil War is composed of more than economics. The paths of the two crossed time and again, and the record has been passed down to us in the letters of individuals and in the columns of contemporary newspapers. The accident of the industry's birth in a time of great national turmoil added an important element to the color and drama of the developments that started America on the road to the highest standard of living in man's history.

The petroleum industry was born on the eve of the great conflict; but the exciting events leading to the Civil War, and then the clash of arms, dominated the national scene for four years and obscured the

Dr. Paul H. Giddens *is the president of Hamline University. He has written several books on various historical aspects of the oil industry.*

Petroleum produced by such wells as the King Bee, near the town of Tidioute, Pennsylvania, was a boon to Northern industry and provided a partial substitute for cotton in the North's overseas trade. The petroleum had considerable local impact as well, transforming Tidioute, for example, into a thriving community of 5,000 with three banks, five churches, and an opera house.

developments that were taking place in northwestern Pennsylvania.

A little more than seven weeks prior to John Brown's seizure of the Federal arsenal at Harper's Ferry Edwin L. Drake drilled, in a wild and secluded spot along Oil Creek, near Titusville, what was destined to become the most famous oil well in the world. With drilling tools weighing just over 100 pounds, made by hand, and costing $76.50, Drake drilled to a depth of 69½ feet and on August 27, 1859, struck oil.

The Drake well was the first to be drilled for the specific purpose of obtaining petroleum in large commercial quantities. It proved that a great subterranean deposit of petroleum lay beneath the earth's surface. It demonstrated in a practical way how petroleum could be produced in abundance. And it provided a source of kerosine at a time when the world's demand for a cheap and efficient illuminant was at a peak.

Without any knowledge of petroleum or previous experience with it, a vast army of men rushed into the oil business. Within a relatively short time the entire valley of Oil Creek between Titusville and Oil City (a distance of 16 miles) had been leased or purchased, and scores of wells were being drilled. By the end of 1860 there were 74 producing wells, yielding about 1,165 barrels daily. These pioneer wells produced more oil than anyone had ever seen, and they created fierce excitement; but they were nothing compared to the great flowing wells drilled along Oil Creek beginning in 1861.

Five days after the first gun of the Civil War was fired on Fort Sumter on April 12, 1861, the driller of the Little and Merrick well at the lower end of Oil Creek struck not only a heavy vein of oil but a huge gas pocket, and the well spouted 3,000 barrels a day. That fall and continuing through 1862 and 1863, other wells were drilled that flowed 1,500 to 6,000 barrels a day.

The price of crude oil plummeted. In January 1861 oil at the wells sold for $10 a barrel, but a year later a barrel brought 10 cents. Overproduction was one key factor in the decline of prices; the financial panic caused by the outbreak of the Civil War was another.

The conflict had some very direct effects upon oil operations.

For example, in the spring of 1863 the war approached Oil Creek. John T. Flynn described the action in *God's Gold:*

"Lee's victorious and apparently invincible army was marching northward. May 2nd and 3rd, 1863, the battle of Chancellorsville was fought and Lee was driving into Pennsylvania.

"The news of this movement sent a shudder of alarm through the oil regions. There was almost total

suspension of business. The price of oil shot upward. Men were asking $3.50 a barrel. . . .

"But workers were leaving for the army. The draft officers were moving around the country gobbling up slackers. By the end of June notices were posted in the oil towns that the draft officers would be in the oil country Monday and Tuesday, July 9th and 10th. The government wanted 700 men from that district. It would be a blow to the business. 'But,' said the *Oil City Register*, 'everyone is ready to face the music.' "

By far the most dramatic instance of the war's impact upon the industry was in the region along the Ohio River where it formed the boundary between western Virginia and Ohio. The Rathbone brothers in this region, who had been in the business of drilling for salt water, had heard about Edwin Drake's famous oil well. Late in 1859 they started drilling for oil at Burning Springs, on the Little Kanawha River, in Wirt County, Virginia; and in May of the next year their well began to produce, at the rate of 100 barrels a day. A second successful well brought thousands of oil hunters to the scene.

When the war began, Virginia seceded and the area became contested ground. Union forces operated in the district, but their main concern was to defend the Baltimore and Ohio Railroad. Confederate guerrillas constantly harassed the area.

In May 1863 General William E. "Grumble" Jones led a force of 3,000 Confederate cavalrymen into Wirt County; when they left, the oilfield was a blazing ruin. Derricks, wagons, boats, barrels, tanks,

On June 14, 1865, the first daily newspaper in the Pennsylvania oil regions was published. The Titusville Morning Herald, *now the* Titusville Herald, *has been in continuous publication since that time. On the front page of this early edition, news of the national conflict just ended shared space with advertisements and reports from the oilfields.*

TITUSVILLE MORNING HERALD.

TITUSVILLE, PA., JUNE 19, 1865.

TELEGRAPH.

Expressly for The Morning Herald by Western Union Line.

Midnight Report.

PRESIDENT JOHNSONS REGRETS

BEN. WOOD TO BE ARRESTED.

GEN. LEE AND A. H. STEPHENS "BEGGING PARDON."

THE MEXICAN NEWS.

THE GOLD QUOTATIONS.

RESIGNATION OF UNION OFFICERS.

REBEL BANK OFFICERS ROBBED OF $200,000.

THE OIL NEWS.

ANOTHER BIG STRIKE ON PIT-HOLE.

TWO HUNDRED AND FIFTY BARREL WELL.

THE FRAZIER WELL YIELDING NINE HUNDRED BARRELS.

PRICES OF OIL ON THE CREEK

[Special Dispatch to the Morning Herald.]

Plumer, June 17th

Attorneys.

W. R. BRIGGS,
Attorney and Counsellor at

J. A. CARWALLADER,
ATTORNEY & COUNSELLOR at
TITUSVILLE, PA.

Livery.

BUSH HOUSE EXCHANGE LIV

Druggists.

J. S. HOODES & Co.,

Now Ready! HYDROSTATIC AIR PUMP FROM DEEP WELLS.

GROCERIES.
Ahead, New York Ahead.

C. H. A

Dry Goods, Gr

which we
to sell at
cash price
ties for pu
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Travelers Ho

An oil refinery at Petroleum Center in 1864. There were fewer than 100 such refineries in the Pennsylvania oil area at the time. Their capacities varied from 15 to 300 barrels a day; main product was kerosine.

and some 150,000 barrels of oil were in flames. The burning oil on the Little Kanawha moved General Jones to write in his official report that "a burning river carrying destruction to our . . . enemy, was a scene of magnificence. . . . It will be many months before a large supply can be had from this source, as it can only be boated down the Little Kanawha when the waters are high."

Burning Springs was the first big industrial complex to be destroyed in the Civil War, and it was the first oil installation ever destroyed in warfare. And although the Burning Springs field was rehabilitated to some extent by war's end, more than two decades were to pass before important new fields were discovered in the area.

By and large, however, despite these instances of direct military action, the new industry flourished, particularly in Pennsylvania. And the new supply of petroleum made its influence felt throughout the North.

In a general way, the industry provided a stimulus to all other branches of business and industry and acted as a powerful force in strengthening the economy of the North. The new demand for barrels to contain oil gave rolling mills a market for an immense amount of hoop iron, and coopers worked at capacity. Tinners were called upon to make thousands of 5- and 10-gallon cans. Machinists had more orders for steam engines and boilers than they could fill. New railroad construction into the oil region was accelerated. Glass manufacturers benefited from the trade in kerosine lamps, globes, and chimneys.

Petroleum itself had a major role. At the beginning of the war the North was cut off from the turpentine districts of the South, and the small supply on hand brought exorbitant prices. The new oil-refining industry provided a satisfactory substitute for turpentine; and the production of varnish, paint, and other such necessaries went ahead unimpeded. The *Scientific American* of May 1861 suggested that "the best oil for guns is coal oil or petroleum."

The very existence of large quantities of kerosine exerted a powerful influence upon the age. And the new supply of lubricating oil played a part in mobilization and expansion of the North's industrial base.

Two little-known applications of petroleum emerge from the records of the war.

The first was medical. Petroleum had been used for centuries both as an internal and an external medicine. A book published just after the end of the Civil War carried the testimony of an assistant surgeon as to the efficacy of petroleum at Gettysburg: "What water is to a wound in an inflamed state, petroleum is to a wound in a suppurating state. It dispels flies, expels vermin, sweetens the wound, and promotes a healthy granulation. Having dressed the wounds of two patients with it, I found they had sunk to sleep before I had finished the dressing of the third."

The second was nautical. During the spring and summer of 1864, while General Grant and his Army of the Potomac were fighting their way toward Richmond, the Navy began experimenting with oil as a substitute fuel for coal. The Navy abandoned the experiments when it was found that under certain conditions petroleum gave off a potentially explosive gas. It was many years before this particular problem was solved.

The North reaped direct financial benefits from the new industry through taxation. A 10-cent-per-gallon Federal tax was levied on refined petroleum in 1862, and two years later a tax on crude oil was added. The Union collected nearly $7 million in this fashion.

And even this immense sum was dwarfed by the

contribution of petroleum as a product for export.

When the Southern States seceded, the Union no longer benefited from the export of cotton; and the balance of trade was running strongly against the North in 1861. The situation was further aggravated by a decline in exports of breadstuffs after 1863. The development of markets for petroleum products overseas made it possible for the Union to make extensive purchases of war materials abroad and to reduce the export of gold. By 1865 the value of this export trade was nearly $16 million, and petroleum ranked sixth among exports.

The course of this trade had not run smoothly during the early part of the war. The danger of Confederate privateers led to war-risk insurance rates that discouraged American shipowners from venturing over the waters, and the North's diplomatic relations with England and France were sufficiently strained to cast a pall over early petroleum export enthusiasts. But by the fall of 1862 the diplomatic tensions had been eased, and the number of merchants willing and able to undertake oil transport had increased. An indication of the extent of overseas trade can be seen in the fact that by 1866 petroleum refiners sold more of their products overseas than at home.

During the war years the new industry had developed new techniques for transporting and refining crude oil. By the end of the conflict tank cars and pipelines were in use, and a simple distillation process for refining crude oil had been thoroughly tested and established. But the situation in Pennsylvania was by no means peaceful and orderly, and the men of the North and South who gravitated to the oilfields after the war provided necessary leadership.

"There was ample exercise in this industrial battle for all the talents of engineers, commissary sergeants and corps commanders," wrote A. R. Crum, editor of the *Romance of American Petroleum and Gas*. In language that likened oilfield activities to military operations, he went on: "When some venturesome wildcatter found oil in a remote locality there was an instant move on the works of the enemy. Trees must be felled, rocks blasted, heights surmounted. Machinery, tools, pipe and material must be sent to the front and urged with all speed. . . . There was always a chance for a 'dry hole' instead of the gusher sought; there was always the danger of fire. . . ."

These veterans, Crum said, had what the industry needed: "The methods, the courage, the discipline, the spirit. . . ."

The mark that the fighting men of the 1860's left upon the petroleum industry was summarized by Crum in 1911: ". . . the ranks of the veterans are thinning rapidly, but their impress upon a young industry is lasting."

LINCOLNIANA

The following anecdotes are based on Sketches in Crude Oil, *by John J. McLaurin, published in Harrisburg, Pennsylvania, in 1898.*

Bishop Matthew Simpson, an eloquent speaker, once delivered a lecture before a large Washington, D.C., audience that included Abraham Lincoln. The topic was "American Progress." As he was leaving the hall with the bishop, the President pointed out that the speaker had neglected to mention the new petroleum industry. "Bishop," said President Lincoln jokingly, "you didn't strike oil."

The production of petroleum in Pennsylvania in the years following Edwin L. Drake's pioneering oil well at Titusville in 1859 worried a number of clergymen. They claimed that the wells interfered with natural processes. One revivalist claimed that the oil was being stored away underground for the Lord's use in destroying the world. Another feared that the fires of hell would be extinguished. At last, a clergyman wrote to the harried President, demanding an end to oil production, claiming that petroleum had been stored in the earth to "grease the axletree of the world in its diurnal revolution."

Petroleum Today herewith presents its readers
with a unique and unprecedented service:
a do-it-yourself feature on a subject that at one time
or another has intrigued most Americans . . .

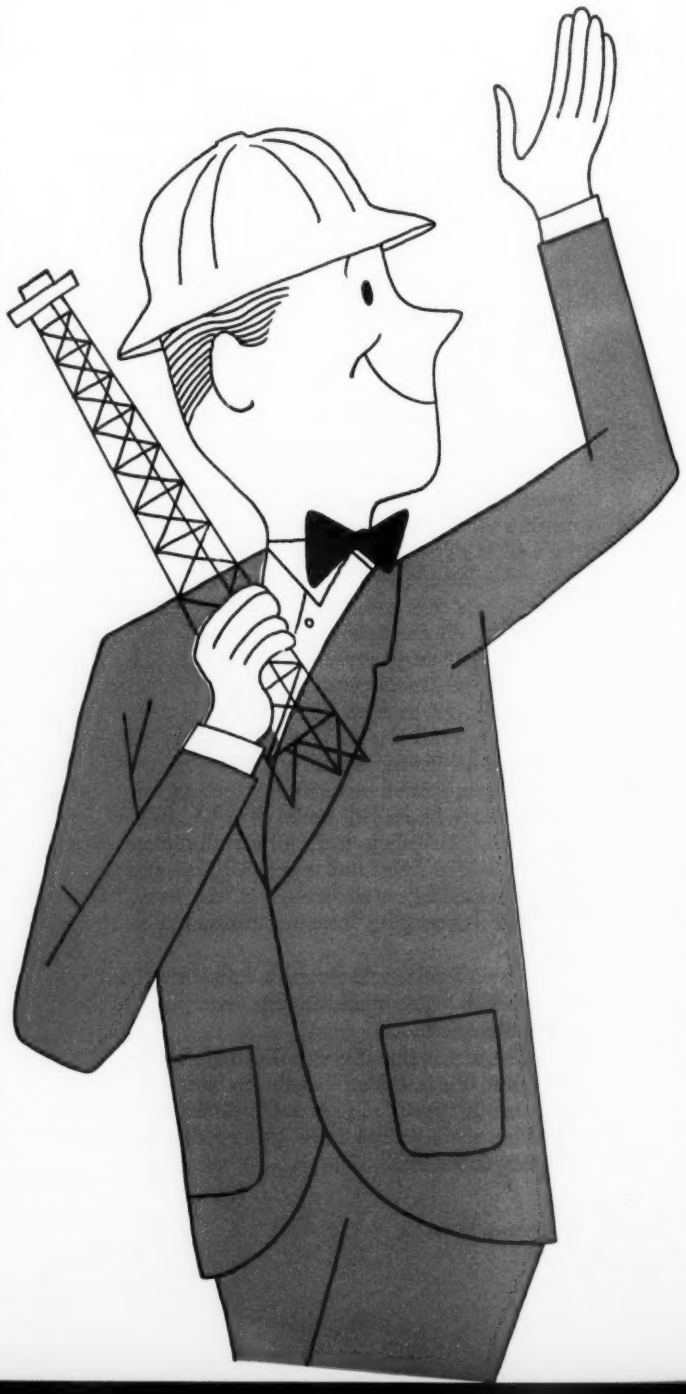
how YOU can strike oil

You are about to enter upon one of the most exciting projects you have ever undertaken. It will not be easy; but then, few things worth doing are easy. You are about to become a wildcatter.

A wildcatter looks for oil where none has ever been found. He is among the most admired and indispensable men in the petroleum industry. As a wildcatter, you will be a part of a long and colorful tradition.

Before we present the step-by-step directions that can lead to your oil strike, there are two points that should be made clear. It is not necessary that you wear special clothes to be a wildcatter. You do not need to purchase boots or a 10-gallon hat; many wildcatters wear business suits. Nor must you assume any special speech patterns or special habits. Though some wildcatters drawl, it is not mandatory; and very few swagger and light cigars with $100 bills. There has been some exaggeration in this regard.

Now you are ready to start. Here are the directions. Good luck!



1. Since oil is formed underground, you cannot expect just to come upon it. You must look for it. This is a process that is very complicated, and we do not suggest that you undertake it by yourself. There have been stories of people who have found oil directly with divining rods and special machines, but to the best of our knowledge such discoveries have been freaks and unrelated to the use of their devices. We recommend that you engage the services of a petroleum geologist. If there are none listed in the yellow pages of your particular telephone book, we suggest that you ask your local librarian for a list of recognized geological organizations; one of them may be willing to aid you.

2. Once you have chosen a petroleum geologist and have spoken with him, you may be somewhat discouraged. He will undoubtedly refuse to promise that he can find oil for you. He may even quote statistics to the effect that eight out of nine new-field wildcat wells do not find any oil or gas and that only

one in 45 wildcat wells discovers a commercially successful oilfield. But remember, if you give up now, you will never be a wildcatter.

3. Your geologist will want to study what may seem to be an unreasonable number of maps and charts. He will also wish to conduct various tests, some of them rather expensive; and he will explain that he is trying to determine the underground rock structures in various locations. It would be wise to give him free rein at this stage. For it is true, as he will tell you, that there is no certain way of finding oil; the best he or anyone can do is find a spot where the geological formations might contain oil.

4. Now you decide where to drill. It is important at this stage that you not be too explicit in telling people the exact location of your spot, nor should you be too enthusiastic about your chances in other people's hearing. This may cause trouble when you make your next step: obtaining the mineral rights for the spot where you wish to drill. We suggest that you approach the owner of the property in a frank and friendly fashion; if he feels that you are seeking to take advantage of him, he may be distraught. Also, we strongly urge that you have the aid of a landman, a specialist who understands the intricacies of leasing operations. It would be unfortunate if you were to find, after striking oil, that the fine print of your lease gave the property owner most of the profits; then *you* would be distraught.

5. The time has come to gather your equipment. It is very important at this stage that you know what you are doing. Unless you plan to devote a considerable amount of time to learning the complicated oilfield equipment business, we would recommend that you hire a man known as a drilling contractor. He has all the equipment that is required (and knows how to use it), whereas you probably don't know the difference between a crown block and a monkeyboard.

6. Once your equipment is gathered and set up, you are ready to "spud in" your well. This is a very exciting moment, the start of the actual drilling. You will want to have your family by your side at the spudding in. By this time, you should have decided upon a name for your well. Many wildcatters name their wells after their children, for luck; and you may find this a wise course to follow.

7. After the drilling has begun, assuming that you have hired a drilling contractor, there is little more that you have to do except wait. Occasionally, after he has gone a certain distance without finding oil, a contractor may ask if you wish to keep drilling. We recommend that you turn this decision over to your petroleum geologist. You would not want to make the wrong decision after all the trouble you have gone to.

8. It may happen that a piece of the drilling pipe will come apart during drilling. This will involve you in one of the most interesting, though costly, activities of a wildcatter. It is known as "fishing." Special tools, and sometimes fishing specialists, are necessary to get the parts of pipe out of the driller's way. Occasionally it may be necessary to abandon the well if the fishing operation proves unsuccessful. Your drilling contractor will be invaluable in helping you to judge whether abandonment is required.

9. You will perhaps begin to wonder at this stage why your drilling contractor does not wildcat on his own. It may be that he has done so and can no longer afford it. As you will have found out by this time, drilling a wildcat well can be quite expensive. The average cost of a well is about $50,000.

10. Essentially, that's all there is to it. Of course, there are many, many ways in which you can vary your approach. For example, if you don't feel that you can make such a large investment out of pocket, you can parcel out the cost among friends or business acquaintances or in-laws. But if the oil is found, then you will have to split your profit with them. Almost every wildcatter does this, though; with all the risks involved only those who light cigars with $100 bills can afford to spend all that money—and as we pointed out earlier, there are very few of them. At this stage, you will understand why.

Forty years ago a handful of engineers joined forces to lead the nation out of its automotive anarchy. The unique organization that resulted has played a little-known but vital role in revolutionizing American transportation.

Up From Chaos

by Wallace West

Once upon a time—in 1921, to be exact—236 makes of automobiles knocked, backfired, and stalled along America's gravel roads and cobbled streets in the good old summertime. (A majority were put up on jacks when cold weather arrived.)

These jalopies, about a million of them, varied in price from $400 for a Model T "compact" to $12,000 for a Locomobile limousine. Their engines had from two to twelve cylinders and were fiendishly complex. The confusion extended to fuels and lubricants as well. Engineers of that day had only the foggiest notion of gasoline's chemical structure or how it burned inside cylinders. One test of fuel "quality"—that is, its ability to give easy starting with a hand crank—consisted in pouring small samples out of a second-story window. If a sample evaporated before hitting the ground, it was rated "premium grade." Motor oils, also, were blended "by guess and by gosh." They often failed to lubricate bearings properly, and they tended to jell in the wintertime.

Into this chaos of 40 years ago there stepped a unique organization that has played a little-known but vital role in American transportation, both in peace and war. Originally it was known as the Cooperative Fuels Research Committee and was composed of seven automotive and seven oil experts. It has since expanded into today's Coordinating Research Council (CRC), headquartered in New York, with a committee structure of nearly 800 oil, automotive, aeronautical, and other engineers.

These scientists are assigned, by the companies that employ them, to the task of promoting the progress of their closely related industries. They are currently engaged in 67 research projects in 100 oil and automotive company, university, and Government laboratories located in various sections of the United States.

The council accepts assignments only when a project has been proposed by the United States Government, or when it is of interest to both the automobile and petroleum industries and is not in a competitive area. Such projects are intended to produce basic information. They supplement, but do not supplant, vast research programs conducted on a competitive basis by individual companies.

Early activities of the Research Committee were concerned almost exclusively with the volatility (the rate of evaporation) of various gasolines. Soaring consumer demand, combined with the rather primitive refining techniques then in use, required that the heavier and less volatile parts of crude oil be incorporated in gasoline. Such fuels knocked even when engines were idling.

The group next undertook three research projects that sought to: (1) Find the best methods for measuring the detonation and antiknock qualities of fuels. (2) Construct a test engine that would permit laboratory study of the detonation process. (3) Encourage oil and automobile companies to set up cooperative field test programs that could supplement work being done in the laboratories of the National Bureau of Standards.

In 1929 a standard test engine was developed. In 1931 the committee created what is known as the Motor Method for measuring knock. And in 1934 it sponsored the first of a series of field tests in which stock models of the newest cars were run with various fuels and lubricants over winding roads near Uniontown, Pennsylvania.

M. K. McLeod, now manager of the Coordinating Research Council, compares road tests with the "covered dish suppers" so popular in many churches: everybody brings only one dish, but all enjoy complete meals. The cars, fuels, and lubricants used at Uniontown were carefully coded so that only their contributors and those conducting the study could know how various products made out in the tests.

Complications developed as soon as the tests started. It was just at this time that refiners developed the revolutionary catalytic cracking process. "Cat cracking," as it was popularly called, enabled refiners to break crude oil molecules apart and recombine them into fuels tailor-made to meet market demand. This ended any threat of a shortage of good high-volatility gasoline. At the same time it encouraged auto manufacturers to increase engine compression ratios in a competitive race to improve the operating efficiency of their cars.

"Uniontown resembled the Tower of Babel after this switchover," recalls Terence B. Rendel, then an engineer and now an oil company executive. "We had been studying volatility. Suddenly that was no longer the main problem. At high compressions, knock became the big bugaboo.

"The addition of tetraethyl lead to gasolines got rid of knock, but then engines developed a puzzling new phenomenon called vapor lock. This made them stall in traffic or refuse to start when they were hot.

"We no sooner licked vapor lock than phenomena called rumble, thud, thump, pre-ignition, post-ignition, deposit-ignition, hotspot-ignition, surface-ignition and crunch developed. In other words, we had our hands full."

The problems that were manifested at Uniontown have never really been solved, but they have been kept under control through CRC efforts. The original gasoline test engine has been adapted to new conditions and is now standard equipment in laboratories throughout the world. Laboratory work has become more widespread and intense. Engineer-drivers have continued their road tests in various parts of the country where the effects of differences in terrain, temperature, humidity, and elevation can be studied. (In 1941, for example, two dozen cars were driven more than 100,000 miles each near San Bernardino, California. It was at that time the drivers began calling themselves the Desert Rats.)

As years passed, the aircraft industry and the Government became increasingly interested in applications of Cooperative Fuels Research Committee methods to evaluation of aviation fuels. The diesel engine industry turned to the CFRC for help. By the early 1940's membership had grown to around 400, and 120,000 typewritten pages of technical data were being prepared and analyzed each year.

Then came World War II. It was imperative

that the engineering resources of the automotive and petroleum industries be made available to the military. However, the United States Government could not sign contracts with a mere committee, and New York State law decreed that the word "cooperative" could be used only by agricultural corporations. An oil technologist had a flash of genius which showed the way around this legal tangle. At his suggestion the old CFRC was reorganized in April 1942 as the Coordinating Research Council and was incorporated the next year.

The council was called upon immediately by more than 30 military and other Government agencies for aid in solving technical problems. At one stage 98 percent of its effort was devoted to this work, with 1,500 investigators engaged in 300 projects to improve military fuels, lubricants, and equipment.

One project called for the Desert Rats to test tanks, mobile artillery, and other motorized vehicles in desert country resembling North African terrain. The tests were conducted in the Great American Desert, near Yuma, Arizona. Kenneth "Slim" Boldt, an engineer who played a leading role in this experiment, recalls that, at this time, American tanks ran on aviation gasoline. Not only was the supply of such fuel extremely limited, but our allies took a dim view of lend-leasing such finicky vehicles. It was vitally necessary to redesign the tank engine so it could run on regular fuel.

This was accomplished in short order with the help of CRC. General George S. Patton, Jr., was so impressed by this breakthrough that he later formed the habit of sending orders for further design changes from North Africa to CRC personnel for approval and forwarding to tank manufacturers in Detroit.

Rugged experiences awaited the Rats when they charged up the recently opened Alcan Highway that winter (1942-43), from North Dakota through Rocky Mountain passes to White Horse in the Yukon. In those days tanks and other armored equipment never started again once their engines stopped in the 60°-below-zero weather.

The alternative was to keep them running 24 hours a day. If one did stop, it was shoved off the road into a snowbank so the rest of the caravan could proceed. As a result of the Alcan Highway tests, fuels and lubricants were developed that succeeded in keeping armored vehicles operative in the most severe weather.

Boldt and other CRC'ers were then assigned to the New London (Connecticut) Navy Yard. There they were asked to: (1) Create deck artillery lubricants that would not leave telltale oil slicks on the sea when submarines had to submerge under enemy fire. (2) Find better fuels and lubricants for torpedoes. (3) Develop other fuels and lubricants for snorkel submarines.

The gun grease problem was solved without too much difficulty. The torpedoes were a thornier assignment: their motors, about the size of one-pound

They Called Themselves "Desert Rats"

The young engineers who volunteered to drive stock cars with new types of engines, gasolines, and lubricants at Uniontown, Pennsylvania, in 1934 found themselves engaged in long hours of hot, dirty, grueling work. And this kind of rough assignment became standard during their World War II testing of military vehicles. They had good reason for calling themselves Desert Rats.

Reunions of the Rats are rare, since members are spread all about the country; but when they do get together, they like to tell these stories from the early days of the war:

A group of CRC engineers had worked through the lunch hour in the blistering heat of the desert, and they decided to cool off at a swank club in Palm Springs. Most of the men put their armored vehicles in the club parking lot; but Slim Boldt drove his 26-ton tank to the main entrance, handed its ignition key to the flabbergasted doorman, and said simply, "Park it, please."

When they had enjoyed a swim, the group returned to the club entrance. Cars were lined up for blocks, waiting for the doorman to figure out a way to get that tank out of the driveway.

One of the CRC engineers touched off a rumor that a Japanese invasion had taken place. He was Gilbert Way, a Chinese-American who stood in his tank's open turret as the vehicle rumbled down a main highway.

An aeronautical engineer named Sandy MacPherson, on assignment with CRC, had purchased several tons of ice to help keep 100-octane fuel samples cool in the desert heat. Sandy is reported to have screamed to high heaven when he received a demand from the vice president of his company that he "list the numbers of bottles of Scotch and soda that had been consumed with the ice." It was some time before Sandy was convinced the vice president was kidding.

M. K. McLeod directs far-flung activities of Coordinating Research Council from its headquarters located in New York City.

Engineer examines equipment used as part of CRC antiknock study at an automobile company laboratory in Michigan.

Typical of CRC's field tests is this one being conducted in a dry river bed in Los Angeles in connection with the council's air pollution abatement program.

coffee cans, had to operate red hot to develop tremendous horsepower for short runs.

"But submarines using snorkels presented the toughest challenge," says Boldt. "When a wave washes over the tube through which the sub 'breathes,' most of the air is sucked out of the ship by its diesel engines. Temperature inside a snorkel sub also shoots up at a fantastic rate.

"When we worked under such conditions on trial runs," says Boldt, "our ears would pop, our eyes would smart, and sometimes we'd think we were going to burst or melt down into blobs. But we kept at it until we finally got the problem licked."

A measure of the importance of CRC's wartime work was the recognition accorded it by the Armed Forces: The Ordnance Distinguished Service Award, the Naval Certificate of Achievement, and the Naval Ordnance Development Award. And the work still continues. Today half of CRC's projects are financed by the Federal Government. The remainder are supported by the American Petroleum Institute and/or the automotive and transport industries.

Current civilian projects range from studies seeking to abate air pollution to those involving jet-fuel icing problems, outboard motor performance, and turbine lubrication. Trains and planes, buses and boats—all have benefited from CRC work. Manager McLeod requires a battery of 20 charming secretaries to keep track of work in progress.

It should be noted that engineers and other representatives of the oil and automotive industries who work within the CRC do *not* set quality standards or specifications for fuels, lubricants, or equipment. Under America's system of free competitive enterprise it is customary for consumers, as well as manufacturers of products, to be consulted before such standards are established.

Therefore the council confines itself strictly to research and the development of laboratory equipment needed for that research. Actual standards are established by Committee D-2 of the American Society for Testing Materials, an organization that includes representatives from many consumer groups.

After 40 years of intensive cooperative research, oil and automotive engineers of CRC admit that they still have a lot to learn. There are only a handful of American automobile lines today, compared to the hundreds back in 1921. Cars have been greatly improved; fuels and lubricants are designed with the help of the most modern technical knowledge. Yet the engineers are a long way from knowing how "that creature of infinite and dogged cussedness," the internal combustion engine, actually works.

Which is why the CRC has as its unofficial motto these words of St. Paul from 2 Corinthians, VIII, 2:

"And if any man think that he knoweth any thing, he knoweth nothing yet as he ought to know."

Growing Pains

The record shows that the necessity for cooperation between the automotive and oil industries was acknowledged as early as 1907, at a meeting of the Society of Automotive Engineers. Ten years later, at a time when consumption of motor fuel was skyrocketing, the National Bureau of Standards called a conference to discuss means whereby the oil industry could maintain a flow of good gasoline to the consumer.

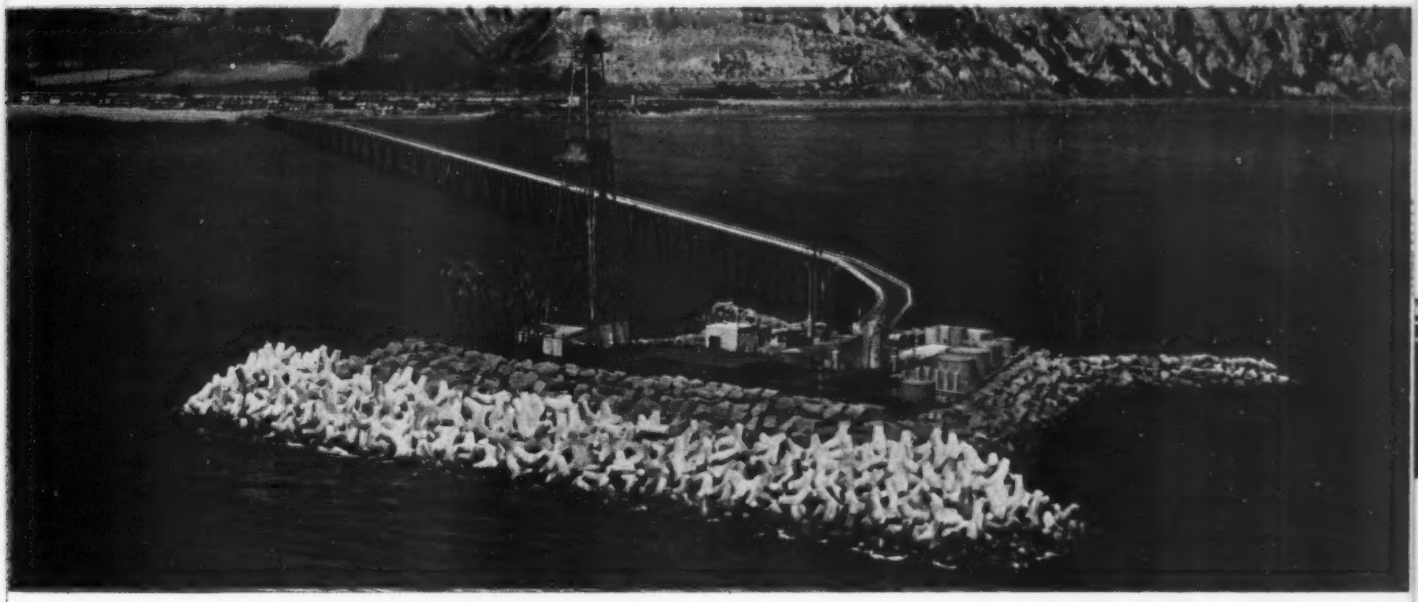
In neither case did the matter get much beyond the talking stage. Competitors were wary of it. And there was considerable friction between the two industries. For example, the auto men wanted the right gasoline for their new engines, and the oilmen complained that they couldn't develop said gasoline without knowing in advance the design of the new, closely guarded engines.

The organization of the American Petroleum Institute in 1919 gave the cooperative movement new impetus. Now the oil industry had a national trade association that could serve as its spokesman. Soon T. A. O'Donnell, API's first president, and Charles F. "Boss" Kettering, president of the Society of Automotive Engineers, were agreeing on the need for action.

An exploratory meeting of oil and auto representatives in that year accomplished little, but two years later the Cooperative Fuels Research Committee was formed. By 1923 the program was operating in high gear. SAE suggested that the fuels and lubricants section of its research program be broadened; the National Automobile Chamber of Commerce and API agreed to share costs of the effort (the two industries have continued this arrangement); many auto and oil companies pledged cooperation.

H. C. Dickinson of the SAE became first secretary of the committee, which directed scientists from auto, oil, Government, and university laboratories; the Bureau of Standards cooperated. Under the leadership of Dickinson's successor, C. B. "Skipper" Veal, a professor of mechanical engineering turned SAE research manager, the committee's young scientists developed the verve, *esprit de corps*, and devotion to duty that still characterize the organization now known as the Coordinating Research Council.

A drilling rig rises among the palm trees
on Rincon Island, a manmade atoll off the California coast,
and the fish population is soaring.



by James Joseph

THE ISLAND THAT OIL BUILT

RINCON Island grows palm trees and an oil derrick. Now it's growing fish. Yet only a few years ago there were no palms, no derrick, no fish—there wasn't even an island.

The site of this unusual industrial enterprise is off the southern California coast near Rincon Point, midway between Santa Barbara and Ventura. The story of its development involves biologists and geologists, barges and junkyards, builders and budgets. And the story is by no means yet complete.

The most recent chapter might be entitled "Apartment Houses for Fish."

Several months ago an oil company barge plied the waters off Rincon Island. Piled high on its deck was a mountain of junk: the rusting remains of more than 120 ancient autos, snatched from wrecking yards. Biologists from the California Division of Fish and Game directed a crane aboard the barge. The crane was methodically consigning the ancient autos to the sea.

Periodically, one of the scientists, clad in skin-diving regalia, would slip overboard to check on progress below. When the operation was complete, a 60,000-square-foot underwater reef of cars had been created. Great numbers of fish have been attracted to the island itself, and it is expected that thousands more will school up at the reef. If all goes as planned, the area should soon become a paradise for fishermen. For, as biologists have discovered, fish are attracted to old cars as bears to honey.

Two hardhatted members of the oil drilling crew enjoy a leisurely lunch hour beneath Rincon Island's imported palm trees.

Rincon Island and its neighboring car reef are positive proof of the proposition that industrial operations can be compatible with the preservation of wildlife. Both reflect an oil company's concern for maintaining the atmosphere of a region.

Sea birds build their nests along the craggy fringes of the scant three acres. Ocean breezes rustle the fronds of its 28 imported palms. Great breakers pound its seaward face, the salt spray settling upon the steel-ribbed derrick planted among the palms. And all this exists just 2,700 feet from the California mainland—from U.S. Route 101 and the right-of-way of the Southern Pacific.

Four years ago what is today Rincon Island was an empty expanse of water, 46 feet in depth. Then came the construction crews who set 800 tons of rock in place for the foundation. Sand and concrete followed. A total of some 400,000 cubic yards of materials were used.

Rincon faces due west into the prevailing winds, her buttressed seaward shore rising 41 feet above the ocean, calculated to withstand waves in excess of 25 feet. Along the side are mammoth precast concrete tetrapods, four-footed structures weighing more than 31 tons apiece. Nearly 1,200 were cast, loaded 25 to a barge, and dropped to protect Rincon's vulnerable shore from the sea.

The island has a built-in "cellar," a wave-protected concourse where some 68 oil wells will even-

Giant concrete tetrapods buttress the island's seaward shore. The barge in the background is preparing for car drop.

The building of an apartment house for fish: Biologists from the California Division of Fish and Game, in small boat at left, direct placement of old autos in the waters off Rincon Island.

tually be drilled. It includes a large reservoir where every drop of waste oil or any other possible water contaminant is collected for removal by barge.

Rincon was constructed to draw oil from a 1,175-acre reserve below the ocean floor. The wells are not drilled straight down but rather at an angle—directional drilling, it's called. Thus a particular well may be anywhere from 800 to 2,400 feet deep, and the bottom of the well may be as far as half a mile seaward from the island.

There are 11 "inhabitants" of the island, 10 oilmen directed by production foreman Charles W. Osborn. Osborn has been on the job since the first well was put down nearly three years ago.

"We've got some of the appearance of an island in *South Pacific*," he says, "but there are some differences too." No South Sea island girls or sarongs; Rincon is "for men only." No fishing; ironically, the island's on-duty oilmen are the only ones prohibited from angling in the newly fish-filled waters. No eaceful nights under the island stars; the men go ashore after work, driving their cars to the mainland over a half-mile-long causeway.

Except for the lunch hour, when Osborn's crew relaxes under the palms with most unromantic sandwiches and thermoses of coffee, Rincon's islanders are engaged in the exacting business of drilling. Two rows of pipe stick up from the cellar area, marking the sites of future wells. The derrick, like a giant auger, merely moves from one pipe to another; eight hours after one well has been completed, another is under way.

What will become of Rincon when the last well is drilled? "We'll dismantle the derrick, haul her ashore, and let the palm trees and the fish take over," Osborn says.

Charles Turner is a marine biologist for California's Division of Fish and Game. He runs a monthly fish count off the island. "Before Rincon was built," he says, "the ocean hereabouts was dead, barren. Now we've counted more than 4,000 fish: Perch, kelp bass, sheephead, opaleye, and sand bass."

Turner and aquatic biologist Earl Ebert believe that the Rincon Island area may well become the State's most popular offshore fishing haunt. Marine biologist John G. Carlisle, Jr., believes manmade reefs may change the habits of the nation's salt water anglers.

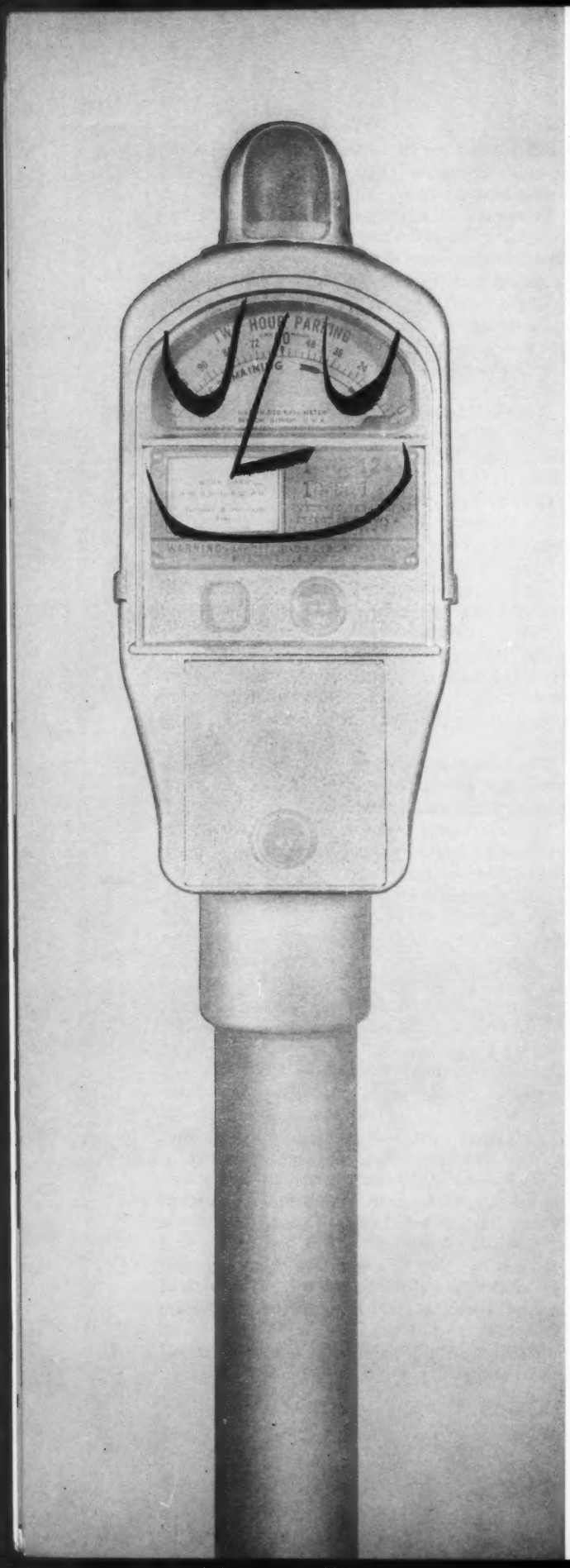
The Rincon Island car reef is not the first such project. Others have been established in waters off Alabama, Texas, and California.

Biologists have long known that fish take shelter in shipwrecks, but the cost of scuttling aging cabin cruisers was prohibitive. The man credited with the idea of using old cars is Roland Walker, a commercial fisherman of Orange Beach, Alabama. (He had had great success in fishing for red snapper near a sunken barge in the Gulf of Mexico.) The Alabama Division of Game and Fish liked the idea enough to invest $70,000 in the project, which got under way in 1955 with the sinking of 250 old car bodies.

Texas was the next State to establish such living quarters for fish, and California followed suit. The California program is the most ambitious yet undertaken; and the "housing" material dumped into the ocean there has even included artificial rocks once used in moviemaking and old six-ton streetcars.

The Rincon Island reef promises to be as attractive to fish as are the others. After the cars were set in place near Rincon, kelp began to attach itself to the reef. Biologists predict that within less than a year the Rincon reef will be overgrown (they say "forested") with kelp and all but hidden by thousands of encrusting organisms (including mollusks, a favorite with sport fish).

By that time, the waters off the island that oil built will be teeming with happily housed fish.



by Homer W. Hathaway

PUT ANOTHER NICKEL IN

REMEMBER the good old days when you could park on any street in town, all day, for free? You don't? Well, it *has* been a long time.

The beginning of the end of the era of free parking came in 1935. The site was Oklahoma City. The local chamber of commerce had proposed a novel solution for traffic congestion of city streets, and in July of that year the first parking meters appeared.

The meter has since come to hold an accepted, if not universally admired, place in the life of 3,850 American cities and towns. But over the years there have been stalwart individuals who have rebelled. Some have tried, with varying degrees of success, to outwit the machine. Others have found some amazing ways to show their contempt.

The day the meters appeared in Oklahoma City, police were kept busy running up and down the street, explaining to irate citizens that it was necessary to turn a handle to make the indicator arrow move. Drivers were discouraged from kicking the machines when the arrow stayed put.

The first appearance of the meters in other cities brought on a rash of singular incidents:

In Dallas, Texas, two cowboys rode into town, hitched their horses to a meter, and deposited their nickels. A passing policeman agreed that they could leave the horses there, since the money had been paid; but they couldn't tie mounts to the meter. Since there were no other likely hitching posts handy, the cowboys moved on.

In Mobile, Alabama, when a crew of men started installing meters, a vigilante committee showed up and chopped the machines down with axes.

In Carthage, Texas, meter crews were met by the

sheriff, who chased the workers away with a shotgun.

But in spite of resistance, the machines had come to stay. They spread like weeds across the nation. Today there are some 2 million in use; they collect more than $127 million annually, and the vast mass of the public pays its money in cowed silence. There have been exceptions, though.

Howard Henry, a well-known farmer in Minot, North Dakota, arrived to put another nickel in just as a local gendarme was ticketing his car. No amount of explanation did any good; the ticket stayed.

When he appeared in court, Henry said:

"My parents traded in this town in horse-and-buggy days. I've traded here since I was old enough to farm. I can recall when the towns were hard up and wanted our trade so badly they put on free movies. Now, if we don't pay to park, they haul us into court like criminals. It isn't American. I'm one farmer who isn't going to pay to park in a State with as much space as North Dakota."

His plea fell on deaf ears; the judge fined him a dollar. Henry paid it, walked to the nearest phone, and canceled all of his spring orders with Minot merchants. Then he began a statewide antimeter campaign. He was ridiculed by city officials, laughed at by newspapers.

"It was after I was sneered at in Minot and was politely ignored in Grand Forks, Fargo, and Bismarck, that I decided to take the issue to the voters," he said.

He secured enough signatures to place a measure on the ballot to outlaw meters, and in the June 1948 primary it passed. Parking meters would no longer collect nickels in North Dakota.

With revenue dropping drastically, city officials all over the State waged a campaign to get the measure repealed in November. The people went to the polls and kept the ban in effect by a majority almost 10 times larger than it had been in June. Today meters are permitted only in municipal parking lots.

A new career is launched

In Hollywood, J. Edward McKinley was unhappy about a parking meter ticket he received. He fought it and beat it. Because so much publicity was given to the case, he found himself appearing on television news and interview programs.

"Next thing I knew," he said, "the movie producers were calling me up to make offers to act in straight dramatic shows." His refusal to pay a two-dollar fine has boosted his income to $25,000 a year.

Most citizens have no idea where their nickels and dimes go. Originally it was thought that meter revenue would be used for street and parking improvements, but many cities just dumped it into a general fund where it could be spent on almost anything the city officials desired. The same sort of diversion of funds is practiced in other areas of government. Federal highway-user taxes, for example, are in large part diverted into the General Fund rather than being spent for highway purposes.

In the case of the meters, at least, some citizens have succeeded in overcoming such diversion. An irate motorist in Ottawa, Kansas, refused to pay a one-dollar parking fine on the grounds that the meter funds were being improperly used. The authorities dropped the case and set up a special fund for meter collections, one devoted exclusively to street improvement and parking accommodations.

There are two other varieties of citizenry who make meter trouble for municipal authorities.

The first is the so-called "meter cheater." He will insert anything from a paper clip to a button to get some parking time. One woman even put in her wedding ring. She said she just didn't have a nickel and was in too much of a hurry to stop and get change. New York meter collectors have found foreign coins ranging from Hong Kong 10-cent pieces to Russian kopeks.

A lawbreaker is apprehended

The second variety of troublemaker is more overtly lawless. He is intent on removing coins from the meter, often with the use of specially designed keys, though his techniques vary. Police in Houston tell of the young boy who claimed it was easy: "If you just suck real hard at the slot, the nickel comes right up. Then you hold it in the slot with your teeth until you can grab it." And in New York police report that a meter was stolen in broad daylight from the street near Borough Hall in Brooklyn. It was found two weeks later on top of the marquee of a theater, its coin box still filled.

A more recent donnybrook over parking meters has resulted from installation of a device that automatically erases the time left behind by a motorist who doesn't use his full nickel's worth. The device has been vigorously opposed wherever it has been tried, most notably in Salt Lake City.

The argument reached its climax when one irate citizen suggested: "If the city feels that someone else may get the space for free, then let it make a refund for the time unused by the original payee [sic] before trying to collect twice!"

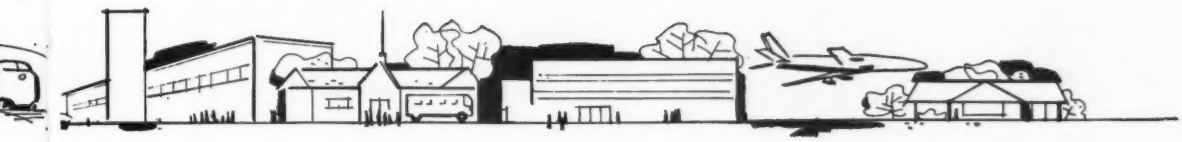
Then a local committee demonstrated that it would cost more to install the device than could possibly be earned in increased revenue. The idea was dropped.

Symbolic of the ever-new public distaste for the parking meter is the fact that it has achieved a sort of literary immortality. A small book of verse, written by one Pete Winslow, was recently published in Seattle. One of the poems is devoted to "the slot machine that never pays off."

TOWN ON THE GO

by Peggy Simson Curry

Casper, Wyoming, is vigorous and restless—an exciting blend of frontier heritage and modern industry.



THIS was Indian country before the fur trappers arrived. It was Oregon Trail country before the cattle came winding in a long dust from Texas to the wind-rippled grasslands and before the Irish sheepherders danced to concertina music on the summer ranges of the Big Horn Mountains.

Casper sprawls along the banks of the North Platte River in central Wyoming—a town of strong personality, vigorous, restless, cosmopolitan; a land of blindingly bright summer days and winter blizzards, of raging winds and spectacular thundershowers. Casper's history is as violent and full of contrasts as its weather.

You can see the contrasts today. By the river, only 15 minutes by auto from the bustling center of town, across earth where Indian arrowheads are exposed by the fierce brush of wind or the wash of spring rains, is the site of the first white man's cabin in the region, built by a band of trappers in 1812. Almost in the shadows of one of modern Casper's oil refineries stands old Fort Caspar, originally known as Platte Bridge Station. Caspar and Casper, the fort and the town, both were named in honor of Lieutenant Caspar Collins, who lost his life leading an attack against superior Indian forces in 1865 at the battle of Platte Bridge. (A frontier Army clerk is said to have given the town its incorrect spelling.) The old fort and the modern town frame our story.

When the Oregon Trail migration began in 1840, the covered wagons gathered where the city now stands, and a safe river crossing was established through the turbulent North Platte. Brigham Young camped here in 1847, when a few trappers' shacks and the rutted trail were the only signs of the white man; and the river crossing became known as Mormon Ferry. By 1852 the number of settlers bound for Oregon had reached a peak, and the Indians were no longer placated by presents or platitudes. In 1859 an Army post (Platte Bridge Station) was established.

In 1868 the cattle began to arrive in large numbers, and Judge Joseph Maul Carey established the CY Ranch. The ranch's "poorest pasture land" was to become the site of modern Casper. Oldtimers spoke of Casper as "a town built on buffalo chips," for the earliest residents were alfalfa growers who gathered fertilizer where they could.

Through the streets of the town rode the Hole-in-the-Wall rustling gang, pursued to its remote hideout in the Powder River country by Bob Divine, foreman of Carey's ranch. Bob vowed he'd "bring back anything wearing the CY brand."

One of the most famous of the many inmates of Casper's jail was Red Cloud, great chief of the Sioux, arrested for hunting antelope to feed his people. The record reads that he was "killing game out of season."

The year 1888 was an important one for the town. The first band of sheep arrived in what is now Natrona County. And the first crude buildings, with corrugated iron roofs and floors of packed gumbo, appeared that summer.

In the fall of 1888 there occurred an event that was to have even more lasting effects upon Casper. Some three miles from the rough new business houses with their flanking of tent residences the first oil well was drilled, known appropriately as Casper well.

Thus two years before Wyoming became a State, the town built on buffalo chips was beginning to have thoughts of another economic base.

While cowboys and Indians roamed the single main street and the canvas walls of the first homes shuddered and popped under the onslaught of the persistent March wind in the spring of 1889, the Casper *Mail* carried this item: "The reported oil strike at Casper Well last week is still shrouded in mystery. Work has been stopped . . . workmen claiming that the two-inch cable is broken and the drill is at the bottom of the well. It is a noticeable fact that the manager and his men have been locating oil claims ever since the 'break' occurred. . . ."

By June, 90 claims had been filed in the Casper area, most of them in the Salt Creek Field. And while other adjoining oilfields, particularly the Big Muddy, have contributed to the growth of Casper, none has been so significant as the Salt Creek Field, approximately 40 direct miles north of town, on the

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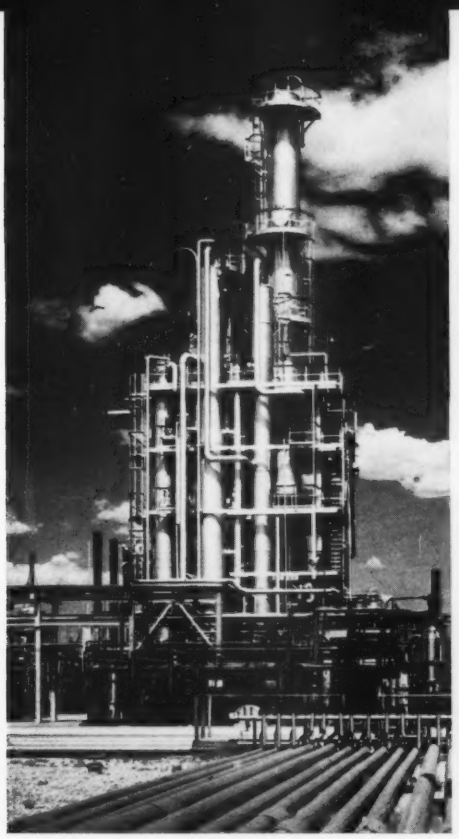
PEGGY SIMSON CURRY, *a resident of Casper, is a novelist whose articles, fiction, and verse have appeared in numerous national magazines.*

Symbols of Casper's past: A "string team" prepares to set out from town with a load of pipe for the nearby Salt Creek Oilfield. . . . Fort Caspar (below) guards a river crossing on the Oregon Trail.



Symbols of Casper's present: A refinery unit towers above the landscape. . . . A citizen strides purposefully through the modern downtown area.

road toward the Big Horn Mountains. Here, in a basin of prairie, surrounded by wind-carved monuments of rock and lifts of broken ridges, was the scene not only of concentrated oil activity but also of violent claim struggles, bawdy and vigorous camp life. Here was found crude oil that came out of the ground so rich that it was said to be "like no other oil anywhere on earth."

Salt Creek's first well was brought in by the Pennsylvania Oil and Gas Company in the fall of 1889. While the cattlemen's range wars were beginning and the sheep business was in its infancy, samples of Salt Creek crude oil were on their way to Pittsburgh for chemical analysis. President Phillip Mark Shannon of Pennsylvania Oil, impressed by results of the tests, continued drilling with great success.

The Union Pacific, Denver and Gulf Railway used this "natural" oil for lubrication for many years. During the first five months of that time, the oil wasn't even treated, there being no refinery in town.

While growing Casper dealt with murder, cattle rustling, problems of education and street development, oil was being hauled from Salt Creek and other fields by the "string team" method. A local newspaper described this early stage of transportation:

"Two string teams were loaded out from here with 26,000 lbs. of piping. One of the teams was made up of sixteen head of horses and four wagons and when the wagons were coupled out to receive the piping, the entire outfit occupied a space of ground 240 feet long and was the longest string outfit that ever went out of Casper. . . ."

Early in 1895 Pennsylvania Oil built the first small refinery in Casper (it was also the first in the State). Politicians, local and national, were subjected to the "45-minute tour." And when they emerged, their shoes and clothing were smudged with oil, but they were smiling.

While dynamic Mark Shannon was heading exploration of Salt Creek, English, French, Dutch, and Belgian businessmen were also becoming interested. Pennsylvania Oil was taken over in 1905 by the Société Belgo-Américaine des Pétroles du Wyoming. This, in turn, was absorbed by a company founded by English, French, and American capital.

But it was the Midwest Oil Company, formed in 1911, that began the most intensive exploration of Salt Creek and built a refinery in Casper and a pipeline and telephone line connecting the town with the field.

There came a time of violent claim disputes; and companies hired line riders, fast on the trigger, to protect their claims at any cost. Often sheriff or deputies arrived too late to prevent bloodshed.

During the latter part of 1916 and most of 1917 Casper became a boomtown. Men in all walks of life deserted professions and business interests to buy and sell oil stock. The Midwest Hotel was a scene of wild

speculation. Those who couldn't get expensive hotel rooms for "offices" set up business in the lobby without benefit of desk or filing cabinets. The town overflowed with people, and new companies were formed overnight. But by the fall of 1917 many brokers had gone out of business, and the town settled into a steadier economy. By 1923 three large refineries were running, one of them the largest in the world at that time.

A second oil flourish hit Casper following World War II, when intensive exploration began not only of new areas but also of old ones. The chance of finding uranium provided an added inducement for visitors. With the upsurge of the oil business Casper became known as "Oil Capital of the Rockies."

In today's Casper, a town of 40,000 as compared to the settlement of 100 when the first well was drilled, two-thirds of the business volume can be traced to petroleum. There are three refineries in or adjacent to the city, three interstate pipelines, 78 oilfield equipment houses, 28 oil hauling concerns, 84 oilfield service houses, 53 oilfield property brokers, 39 consulting geologists and geophysicists, 73 oil company exploration and production offices, and 41 drilling contractors.

Wyoming produces about as much oil as Brazil and Mexico combined. And of the $22 million spent annually for petroleum exploration in Wyoming, it is estimated that 90 percent is spent in and from Casper.

Today's Casper is as colorful as its vivid past. "Nobody ever goes to bed in Casper" is an assumption based on visual evidence, for there are people moving on Center Street any night of the week between dark and daylight. And, as in the days of the frontier, a man's best passport to recognition is the force and individuality of his own character.

It is not considered an anomaly to see a cowboy wearing his high-heeled boots at a gathering where tuxedos predominate. Nor is it considered strange that a wealthy man's friend may be a sheepherder.

The town is creative. Art classes are crowded, night and day, at growing Casper College; and art exhibits hang in banks, cafes, and hotels. Music is a vital interest in the town; and it is often remarked, between pride and laughter, that an amazing number of people turn out to hear anyone play a piano. The Community Concert series is well supported, and the Civic Symphony boasts that 15 of its musicians travel more than 100 miles to attend weekly rehearsals. Casper College's theater-in-the-round draws packed houses, and anyone in town is likely to show up in grease paint at the Paradise Valley Play House.

This then is Casper—Indian campground, frontier fort, cow town, sheep town, oil town—imaginative, impulsive, colorful, and, as might be expected from its past history, always on the go.

What's in a Name?

Much of the color and humor of Casper's early days was captured in the nicknames of its pioneer citizens. "Give a Damn" Jones, for example, was a peace officer known by a favorite expression he used. "Puzzle Face" Reed earned his title at the poker table. And there were "Hard Winter" Davis; "Sod Corn" Gore; and the Lucas brothers, "Big Bones" and "Little Bones."

The citizens of present-day Casper have an inherited fondness for nicknames. Ben Scherck, a realtor whose firm is the oldest in town, is still known as "See Ben" Scherck on the basis of his catchy business slogan, "A Look Means a Lot."

Perhaps the most famous of Casper nicknames straddles three generations. Back before the turn of the century a young man named McGrath was assigned to dig postholes on the ranch of B. B. Brooks, later to become Wyoming's Governor. McGrath had barely begun work when Brooks was called away for what was to be a three-day stay in Cheyenne. "Keep digging until I get back," Brooks told his man.

McGrath kept digging while Brooks' three-day visit stretched into three weeks. When the rancher returned, so the story goes, the line of holes stretched far over the horizon. McGrath was known ever after as "Posthole" McGrath, his son inherited the nickname, and a grandson today actually has "Post" as his legal name.

ART AND PHOTO CREDITS

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As the bit chews deeper and deeper into the earth, the drilling crew adds length upon length of pipe. Seen in silhouette, freed from the tangle of equipment on the rig floor, the oilmen move with practiced teamwork and unconscious grace.